

PATENT CLAIMS

- 5 1. Aqueous solution for post-etch residue removal having a reduced etching rate, comprising an organic acid from the group consisting of hydroxy-carboxylic acids and/or the group consisting of mono-, di- and tricarboxylic acids, in the presence of an oxidant, and optionally additives for improving the cleaning action and inertisation to Al, Cu, Ti, W, Al/Cu, TiN and SiO₂ surfaces.
- 10 2. Aqueous solution according to Claim 1, comprising corrosion inhibitors selected from the group consisting of imidazoline compounds.
- 15 3. Aqueous solution according to Claims 1 and 2, comprising one or more compounds from the group consisting of benzimidazoles, aminobenzimidazoles and 2-alkylbenzimidazoles, including alkyl-substituted imidazolines and 1,2-dialkylimidazolines and oleic hydroxyethyl imidazoline as corrosion inhibitors.
- 20 4. Aqueous solution according to Claim 1, comprising at least one aprotic polar solvent.
- 25 5. Aqueous solution according to Claims 1 and 4, comprising at least one aprotic polar solvent from the group consisting of N-methylpyrrolidone (NMP), ethylene glycol, propylene glycol, dimethyl sulfoxide (DMSO) and 1-methoxy-2-propyl acetate (PGMEA).
- 30 6. Aqueous solution according to Claim 1, comprising at least one surface-active substance.
- 35 7. Aqueous solution according to Claims 1 and 6, comprising at least one anionic surfactant and/or nonionic surfactant as surface-active substance.
8. Aqueous solution according to Claim 7, comprising at least one anionic surfactant from the group consisting of aliphatic carboxylic acids and alkylbenzenesulfonic acids and/or at least one nonionic surfactant from the group consisting of alkyl oxalkylates and alkylphenol oxethylates.

- 5 9. Aqueous solution according to Claim 8, comprising at least one anionic surfactant from the group consisting of heptanoic acid, octanoic acid and dodecylbenzenesulfonic acid and/or at least one nonionic surfactant from the group consisting of fatty alcohol alkoxylates, octylphenol oxethylates and polyoxyethylene sorbitan fatty acid esters (Tween[®]).
- 10 10. Aqueous solution according to Claims 1 to 9, comprising at least one organic acid from the group consisting of glycolic acid, lactic acid, hydroxybutyric acid, glyceric acid, malic acid, tartaric acid, citric acid, malonic acid, succinic acid, glutaric acid and maleic acid.
- 15 11. Aqueous solution according to Claims 1 to 9, comprising at least one oxidant from the group consisting of hydrogen peroxide and ammonium peroxodisulfate.
- 20 12. Aqueous solution according to Claims 1 to 11, comprising an organic acid from the group consisting of hydroxycarboxylic acids and/or the group consisting of mono-, di- and tricarboxylic acids in an amount of from 0.1 to 30%, based on the total weight.
- 25 13. Aqueous solution according to Claims 1 to 11, comprising an oxidant in an amount of from 0.1 to 10%, based on the total weight.
- 30 14. Aqueous solution according to Claims 1 to 11, comprising at least one corrosion inhibitor in an amount of from 1 ppm to 1%, based on the total weight.
- 35 15. Aqueous solution according to Claims 1 to 11, comprising at least one aprotic polar solvent in an amount of from 0.1 to 10%, based on the total weight.
16. Aqueous solution according to Claims 1 to 11, comprising at least one aprotic polar solvent in an amount of from 0.1 to 10%, based on the total weight.
17. Aqueous solution according to Claims 1 to 11, comprising at least one anionic surfactant in an amount of from 1 ppm to 1%, based on the weight, and/or at least one nonionic surfactant in an amount of from 1 ppm to 1%, based on the weight.

18. Aqueous solution according to Claims 1 to 11, comprising at least one wetting agent from the group consisting of enanthic acid, Triton[®] X100, Tween[®] 20, dodecylbenzenesulfonic acid and Plurafac[®] 120 in an amount of from 100 to 1000 ppm.
- 5 19. Aqueous solution according to Claims 1 to 11, comprising citric acid, hydrogen peroxide, N-methylpyrrolidone (NMP) and optionally additives.
20. Solution according to Claim 19, comprising citric acid in an amount of from 0.1 to 30%, hydrogen peroxide in an amount of from 0.1 to 10% and N-methylpyrrolidone in an amount of from 0.1 to 10%.
- 10 21. Solution according to Claims 19 – 20, comprising a corrosion inhibitor in an amount of from 1 ppm to 1% and a wetting agent in an amount of from 1 ppm to 1%.
- 15 22. Use of an aqueous solution according to Claims 1 – 21 for the production of semiconductors on spray tools or in tank units.

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